

Supplemental Action

This supplemental action was made necessary because the previous Office Action incorrectly included canceled claims in the claim rejection. Please see the attached Interview Summary.

Response to Arguments

Applicant's arguments filed 12-26-2007 have been fully considered but they are not persuasive with respect to claim 20. Claim 20 is an apparatus claim and is therefore rejected with respect to the apparatus limitations, which are taught by the prior art of record as applied in the rejections of the prior office action. It was pointed out in the rejection that the steps and the apparatus for carrying out the steps as discussed in the rejection were taught by the prior art of record. For example, Chun teaches a process chamber and a heater in the substrate pedestal for the substrate and chambers for remotely exciting the gases as well as a manifold which Fig. 2 shows has entrance pipes for the separate gases(Fig. 1, Fig. 2, and paragraph 0026). In addition, as pointed out in the rejection, Chun further teaches a controller, and other apparatus for carrying out the process as pointed out in the rejection.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 20 is rejected under 35 U.S.C. 102(e) as being anticipated by Chung et al (US 2004/0018304A1).

Chung et al disclose and apparatus and the process of disposing a substrate within a chamber, the substrate being a semiconductor wafer which may be silicon(paragraph 0032), the gas is activated remotely from the chamber(paragraph 0035), the precursor is pulsed to the chamber(paragraph 0040). An activated reducing gas which is activated remotely from the chamber may be provided to the chamber(paragraph 0046 and 0047). The steps are repeated(paragraph 0049). The precursor and the reducing gas may be activated (paragraph 0050). A metal may be deposited(paragraph 0057) or a metal compound(paragraph 0057). The thickness of the layer is within the recited range and the film formed may be a TiN barrier layer(paragraph 0057). The reducing gas may be NH₃(paragraph 0053). The precursor may be TDMAT, which satisfies the limitation of claim 13(paragraph 0052). The temperature is within the recited range(paragraph 0038). There is a microprocessor controller which regulates the reactor and the gas injection(paragraph 0020). Carrier gas alternates with the reactive gases(paragraph 0031). The process chamber includes a heated substrate pedestal(paragraph 0019). The gas may be supplied not activated and the activation may be within the chamber (paragraph 0026

Allowable Subject Matter

Claims 16-19 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Caridad M. Everhart whose telephone number is 571-272-1892. The examiner can normally be reached on Monday through Fridays 7:30-4:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Caridad Everhart/
Primary Examiner
AU2891

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